CLAIMS

What is claimed is:

1. An interconnect assembly comprising:

a substrate;

a resilient contact element having at least a portion thereof which is capable of moving to a first position in which said resilient contact element is in mechanical and electrical contact with another contact element, said resilient contact element being disposed on said substrate;

a stop structure disposed on said substrate, said stop structure defining said first position.

2. An interconnect assembly as in claim 1 wherein said another contact element is disposed on another substrate, and wherein said stop structure defines a separation between said substrate and said another substrate when said resilient contact element is in mechanical and electrical contact with said another contact element.

3. An interconnect assembly as in claim 2 wherein said stop structure is disposed proximally adjacent to said resilient contact element on said substrate.

4. An interconnect assembly as in claim 2 wherein said resilient contact element comprises a spring structure.

5. An interconnect assembly as in claim 2 wherein said stop structure comprises an adhesive layer.

6. An interconnect assembly as in claim 5 wherein said adhesive layer is for bonding to said another substrate.

7. An interconnect assembly as in claim 2 wherein said substrate and said another substrate are forced toward each other by a vacuum generated between said substrate and said another substrate.

8. An interconnect assembly as in claim 2 wherein said substrate and said another substrate are forced toward each other by one of a pressurized bladder or a bellows and wherein a fluid in said bladder or said bellows is capable of controlling a temperature of at least one of said substrate and said another substrate.

9. An interconnect assembly as in claim 2 wherein said interconnect assembly is part of a probe card assembly.

10. An interconnect assembly as in claim 2 wherein said interconnect assembly is part of a wafer-level test assembly.

11. An interconnect assembly as in claim 2 wherein said stop structure is formed lithographically.

12. An interconnect assembly as in claim 2 wherein said stop structure is formed from one of (a) a photoresist material; (b) an epoxy material; (c) a metal coated with an electrophoretic epoxy or (d) a polymeric material.

13. An interconnect assembly as in claim 2 wherein said stop structure is formed from a sheet material in which an opening exists and said resilient contact element is disposed in said opening.

14. An interconnect assembly as in claim 13 wherein a plurality of resilient contact elements are disposed on said substrate in corresponding openings in said sheet material which is disposed on said substrate.

15. An interconnect assembly as in claim 14 wherein said sheet material comprises an adhesive layer.

16. An interconnect assembly comprising:

a first substrate;

a first contact element disposed on said first substrate;

a stop structure disposed on said first substrate, said stop structure defining a first position of a resilient contact element in which said resilient contact element is in mechanical and electrical contact with said first contact element.

17. An interconnect assembly as in claim 16 wherein said resilient contact element is disposed on a second substrate and wherein said resilient contact element has at least a portion thereof which is capable of moving to said first position when said resilient contact element is compressed.

18. An interconnect assembly as in claim 17 wherein said stop structure is disposed proximally adjacent to said first contact element.

19. An interconnect assembly as in claim 17 wherein said resilient contact element comprises a spring structure.

20. An interconnect assembly as in claim 17 wherein said stop structure comprises an adhesive layer.

21. An interconnect assembly as in claim 20 wherein said adhesive layer is for bonding to said another substrate.

22. An interconnect assembly as in claim 17 wherein said first substrate and said second substrate are forced toward each other by a vacuum generated between said first substrate and said second substrate.

23. An interconnect assembly as in claim 17 wherein said first substrate and said second substrate are forced toward each other by one of a pressurized bladder or a bellows and wherein a fluid in said bladder or said bellows is capable of controlling a temperature of at least one of said first substrate and said second substrate.

24. An interconnect assembly as in claim 17 wherein said interconnect assembly is part of a probe card assembly.

25. An interconnect assembly as in claim 17 wherein said interconnect assembly is part of a wafer-level test assembly.

26. An interconnect assembly as in claim 17 wherein said stop structure is formed lithographically.

27. An interconnect assembly as in claim 17 wherein said stop structure is formed from one of (a) a photoresist material; (b) an epoxy material; (c) a metal coated with an electrophoretic epoxy or (d) a polymeric material.

28. An interconnect assembly as in claim 17 wherein said stop structure is formed from a sheet material in which an opening exists and said first contact element is disposed in said opening.

29. An interconnect assembly as in claim 28 wherein a plurality of first contact elements are disposed on said first substrate in corresponding openings in said sheet material which is disposed on said substrate.

30. An interconnect assembly as in claim 29 wherein said sheet material comprises an adhesive layer.

31. An interconnect assembly as in claim 2 wherein said substrate is a semiconductor integrated circuit.

32. An interconnect assembly as in claim 17 wherein said first substrate is a semiconductor integrated circuit.

33. A method for forming a stop structure on a substrate, said method comprising:

forming a plurality of openings in a sheet;

applying said sheet to a substrate;

forming a plurality of contact elements on said substrate in locations corresponding to said plurality of openings, wherein said sheet comprises at least one region disposed around at least one of said openings which is said stop structure.

34. A method as in claim 33 wherein said stop structure defines a first position of a resilient contact member on another substrate in which said resilient contact member is in mechanical and electrical contact with one of said contact elements in said at least one of said openings.

35. A method as in claim 33 wherein each of said contact elements comprises a resilient contact element disposed on said substrate and which is capable of moving to a first position and wherein said stop structure defines said first position in which said resilient contact element is in mechanical and electrical contact with another contact element on another substrate.

36. A method as in claim 33 wherein said substrate is a wafer of semiconductor integrated circuits and said sheet fits on said wafer.

37. A method as in claim 33 wherein said sheet comprises a polyimide material.

38. A method as in claim 33 further comprising applying an adhesive layer to said sheet.

39. A method as in claim 33 wherein said plurality of openings is formed before applying said sheet to said substrate and wherein said plurality of contacts are formed before said sheet is applied to said substrate.

40. A method as in claim 33 wherein said plurality of openings is formed after applying said sheet to said substrate.

41. A method for forming an interconnect assembly, said method comprising:

forming a resilient contact member having at least a portion thereof which is capable of moving to a first position, said resilient contact member being formed on a substrate;

forming a stop structure on said substrate, said stop structure defining said first position in which said resilient contact element is in mechanical and electrical contact with another contact element.

42. A method as in claim 41 wherein said another contact element is disposed on another substrate.

43. A method as in claim 41 wherein said stop structure is formed proximally adjacent to said resilient contact member.

44. A method as in claim 41 wherein said resilient contact member comprises a spring structure.

45. A method as in claim 42 further comprising forcing together said substrate and said another substrate.

46. A method as in claim 41 wherein said stop structure is formed lithographically.

47. A method for forming an interconnect assembly, said method comprising:

forming a first contact element on a first substrate;

forming a stop structure on said first substrate, said stop structure defining a first position of a resilient contact element in which said resilient contact element is in mechanical and electrical contact with said first contact element.

48. A method as in claim 47 wherein said resilient contact element is disposed on a second substrate.

49. A method as in claim 47 wherein said stop structure is formed proximally adjacent to said first contact element.

50. A method as in claim 48 further comprising:

forcing together said first substrate and said second substrate, wherein said stop structure defines a minimum separation between said first substrate and said second substrate in which said resilient contact element is in mechanical and electrical contact with said first contact element.

51. A method for forming a stop structure on a substrate, said method comprising:

applying a sheet to said substrate;

forming at least one first contact element on said substrate, said first contact element having a first height relative to said substrate and said sheet having a second height relative to said substrate, said sheet defining a minimum separation which is capable of existing between said substrate and an another substrate having a second contact element which is in mechanical and electrical contact with said first contact element when said minimum separation exists.

52. A method as in claim 51 wherein said sheet is a perimeter stop structure.

53. A method as in claim 51 wherein said first contact element is a resilient contact element and said first height is greater than said second height.

54. A method as in claim 51 wherein said second contact element is a resilient contact element and said first height is less than said second height.

55. A method as in claim 51 wherein said sheet comprises an adhesive material which secures said sheet to said substrate.

56. A method as in claim 51 wherein said sheet covers only a portion of said substrate.

57. A method as in claim 51 further comprising:

forcing together said substrate and said another substrate such that they are separated by said minimum separation.